APRIL/MAY 2025

23UCA31 — DATA STRUCTURE AND ALGORITHMS

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. How the doubly linked list can be represented?

2. State the advantages of Circular lists over doubly linked list.

3. Write the postfix form of an expression
   – A + B – C + D.

4. Distinguish between Stack and Queue.

5. What are the different ways of representing a Binary Tree?

6. Distinguish between Binary Tree and Tree.

7. Give an example for Cut –Vertex.

8. Draw an Undirected Graph.

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9. What are the problems in Hashing?

10. Distinguish between Shell Sort and Radix Sort.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Exemplify the Polynomial Addition.

Or

(b) Briefly describe the linked list implementation.

12. (a) Write the Postfix and Prefix Forms of the expression $A + B * (C - D) / (P - R)$.

Or

(b) Expound any two Operations on Stack.

13. (a) Write a procedure for in-order and Post-order Traversals.

Or

(b) Summarize about the applications of Heap.

14. (a) Describe the various representation of Graph with suitable example.

Or

(b) Design an Algorithm to perform Topological Sort.

15. (a) With suitable example, explain the concept of Binary Search.

Or

(b) Write the procedure to perform searching operations using Linear Search.

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SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the operations of doubly linked Lists.

17. Discuss about the applications of Queue.

18. Expound the concept of B+ Tree with their significances.

19. Illustrate the Breadth-First Tree Traversals with Pseudo code and necessary diagrams.

20. Explicate any two hashing techniques.

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